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THREE POLYMORPHIC ALLIANCES IN EPIDENDRUM

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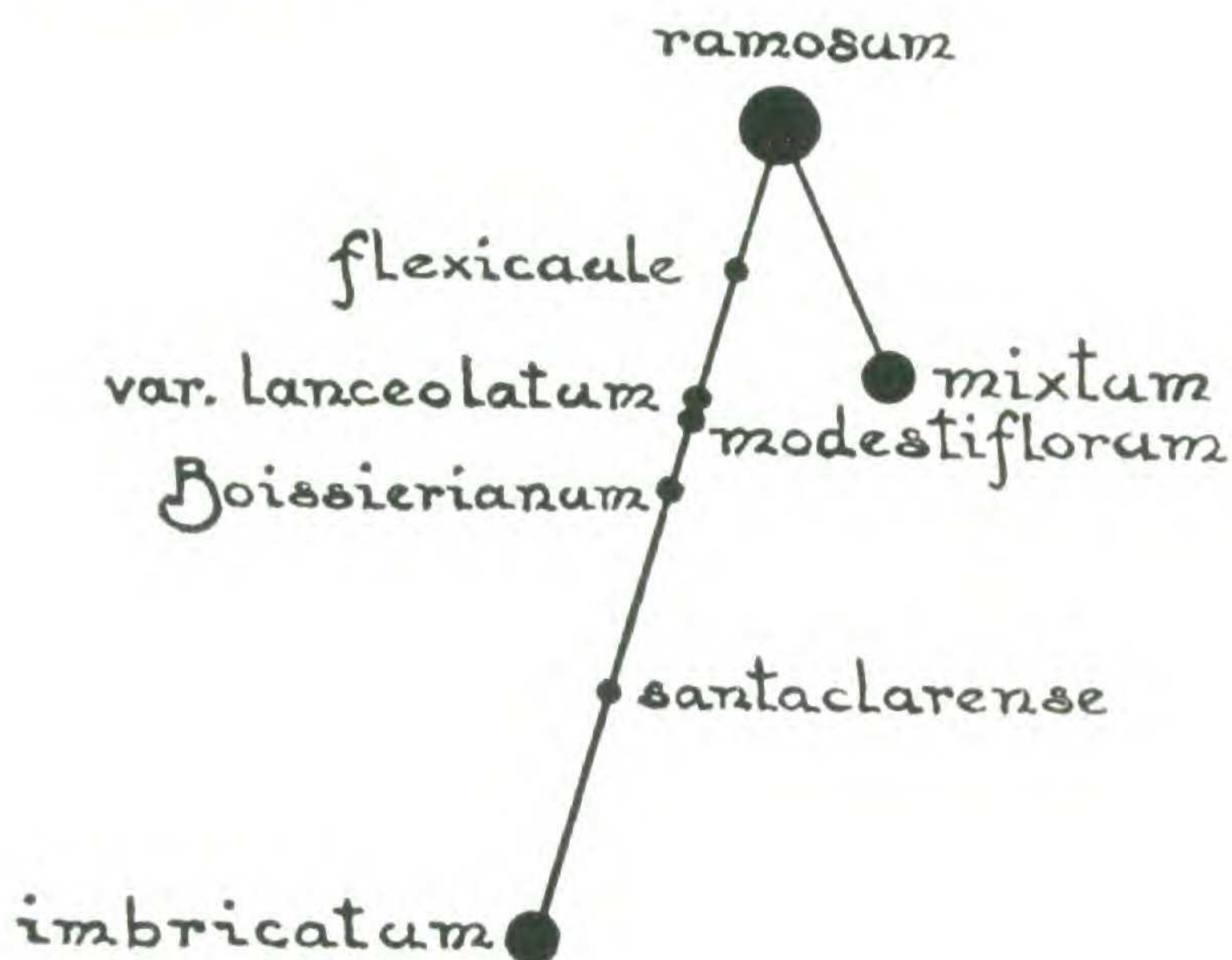
IN PREPARING a key to the Continental North American species of *Epidendrum*, several alliances showing wide variations in form and character have been variously interpreted as species and as synonyms. Among these alliances are *Epidendrum ramosum* Jacq., *E. difforme* Jacq. and *E. paniculatum* Ruiz & Pav.

EPIDENDRUM RAMOSUM ALLIANCE

Given a limited number of specimens representing the extremes of the different variants, one would at once determine them as species, but a careful study of a large amount of material has led us to believe that all the variations are referable to one polymorphic species comprising a typical form and two groups which vary consistently enough to be recognized as varieties.

The typical form of *Epidendrum ramosum* as described by Jacquin and as illustrated by him (a fragment of the end of a branch only) is a rather strict plant with laxly 4-to 5-flowered racemes and ligulate leaves which are 2-5 cm. long and 4-8 mm. wide. This represents one of the smaller-flowered forms of the alliance. Transitions from this through the more slender, more flexuous, fewer-flowered form described as *E. flexicaule* Schltr. to the

more dwarf, usually 2-flowered variant called *E. ramosum* var. *lanceolatum* Griseb. (which is scarcely separable from Schlechter's *E. modestiflorum*) can be readily traced. The *E. modestiflorum* form grades into the variant named *E. Boissierianum* Schltr. (*E. biflorum* Cogn., nec Forst.f., nec Ruiz & Pav., nec Rodr.) and through it to *E. santaclarensense* Ames and to the extreme form represented by *E. imbricatum* Lindl. (cf. diagram); this form being characterized by its stout stems, large leaves, dense head-like racemes of relatively large flowers and very conspicuous conduplicate bracts.



Another line of transition leads through varying vegetative characters and variation in the callus of the lip to the form described as *E. mixtum* Schltr. The type of *E. mixtum* is a tall very stout plant with large branches and two forms of leaves; that is, the leaves of the primary stem are much larger and longer than those of the secondary stems.

The extreme phase of any one of these named forms is very distinct, but the presence of gradients from one phase to another convinces us that the extremes should be

regarded as the terminating phases of one strain of a polymorphic species.

In general it may be said that no sharp line of demarcation can be found in either the floral or vegetative characters exhibited by *Epidendrum ramosum*. The size of the flower, the texture of the flower, and the form of the floral segments vary in any one of the forms. The inflorescence in any proposed concept varies in density, in the number of flowers, and in spread. The bracts of the inflorescence range widely in size, in the degree of conduplication or convolution, in being strongly carinate to perfectly rounded and ecarinate on the outer surface, in the presence or lack of maculation and in several other characters that might be mentioned. The vegetative characters are quite as variable. They range from a small rather strict form to a lax, weak and much branched form, as well as to a stouter, more or less branched variant (*E. modestiflorum*). In the var. *imbricatum*, there is also decided variation in the height and branching of the plant, but the stems are consistently robust. In var. *mixtum*, the habit is extremely variable, ranging from the very stout, tall, heavily branched type of *E. mixtum* to specimens from Guatemala collected by Johnson (no. 552) and from Honduras collected by J. B. Edwards (nos. 67, 71 and 245). The specimens are habitually similar to the typical form of *E. ramosum*. Even the characters of the column and of the callus are variable and show intergradation between recognized forms.

A short discussion of the salient characters of the several forms described as species should be helpful.

E. flexicaule Schltr. of which the type was collected by C. Wercklé at La Palma in Costa Rica differs from the typical West Indian form of *E. ramosum* in having rather weaker stems that appear to be normally less branched.

E. ramosum var. *lanceolatum* Griseb. has broader leaves and larger bracts and flowers. As interpreted by Cogniaux, the variety *lanceolatum* seems to have 2-flowered inflorescences. In our judgment, this is the West Indian representative of Schlechter's *E. modestiflorum*.

E. modestiflorum Schltr. of which the type was collected by A. M. Brenes no. 128 in August 1921 at San Pedro de San Ramon, Costa Rica, differs in its stiffer and stouter habit, usually 2-flowered inflorescence and broader thicker leaves. Its habit is also more dwarf and often less branched.

E. Boissierianum Schltr. (a new name for *E. biflorum* Cogn., which is a homonym) is a plant much like *E. modestiflorum* in habit, but approaches *E. imbricatum* Lindl. in some of its characteristics. The type was collected in Costa Rica by Ad. Tonduz.

E. santaclarenses Ames, of which the type is C. H. Lankester & A. Sancho no. 443, collected at Santa Clara south of Cartago, Costa Rica, is a robust branched plant with lax inflorescences, with the flowers somewhat similar to those of *E. modestiflorum* and with the bracts of the inflorescence also suggesting those of *E. modestiflorum*, but more elongated. It seems strictly intermediate between the two forms *E. modestiflorum* and *E. imbricatum*.

E. imbricatum Lindl. of which the type was collected by Prescott in Brazil and which is also represented by Gardner no. 630 from the Organ Mts., Brazil, typically has a head-like inflorescence "two inches long, by one and a half inch broad." (fide Lindley, Fol. Orch. Epid. p. 78). The bracts of the inflorescence are carinate, conduplicate and large in the extreme form (cf. diagram on p. 42), but vary toward those of the *E. modestiflorum* form. The inflorescence also is often less head-like, more open and fewer-flowered than in the plants described by

Lindley.

E. mixtum Schltr.,—of which the type collection is H. von Tuerckheim no. II 1868, December 1908, near Coban, Guatemala,—is a stout, tall plant with elongated branches subtended by large lorate leaves (up to 25 cm. long and 2 cm. broad). The leaves of the primary stems are much larger than those of the branches. The flowers are much larger than those of the typical form and are borne in drooping racemes. The bracts of the inflorescence are about intermediate in size between those of Jacquin's type and the form called *E. imbricatum*. The principal point of distinction, however, is the callus of the lip which is tridentate or trilobulate at its apex. This character seems to us to be more diagnostic than the very variable vegetative differences, and even this character is approached in some specimens of the typical form and of the *E. imbricatum* variant.

In spite of intergradation, however, we feel that there are three rather clearly marked forms based upon fairly consistent trends of grouped characters and we are convinced that these trends of grouped characters indicate an alliance composed of a species and two varieties, as follows:

Epidendrum ramosum *Jacquin*, Enum. Pl. Carib. (1760) 29 and Select. Stirp. Am. (1763) 221, t. 132.

Isochilus ramosum Sprengel, Syst. Veg. 3 (1826) 734.

Epidendrum rigidum Loddiges, Bot. Cab. 16 (1829) t. 1600, non Jacq.

Epidendrum ramosum Jacq. var. *lanceolatum* Grisebach, Fl. Brit. W. Ind. (1864) 618.

Epidendrum ramosum Jacq. var. *lancifolium* Cogniaux in Martius, Fl. Bras. 3, pt. 5 (1898) 173, sphalm.

Epidendrum flexicaule Schlechter in Beihefte Bot.

Centralbl. 36, Abt. 2 (1918) 403.

Epidendrum modestiflorum Schlechter in Fedde Repert. Beihefte 19 (1923) 213.

Spathiger ramosus Britton in Sci. Surv. Porto Rico and the Virgin Islands (Britton & P. Wilson, Bot. Porto Rico and the Virgin Islands) 5, pt. 2 (1924) 202.

Plant very variable in habit, upright, pendulous or apparently creeping, simple to much branched. Stems slender and often flexuous to stiff and rather stout (up to 4 mm. in diameter just below the inflorescences) 12 cm. up to 90 cm. tall or long, the main stem often somewhat woody, concealed by the persistent leaf-sheaths, often rooting above when creeping or decumbent. Branches variable in length and number, subtended by a leaf which is apt to be larger in dimensions than those of the branches or by a leaf-sheath, spreading or decumbent to upright. Leaves more or less coriaceous, very varied in shape, ligulate to linear-ligulate, lanceolate to oblong-elliptic and all intermediate forms, .9–12 cm. long, 2–14 mm. wide (usually less than 10 mm. wide), apex unequally bilobed. Inflorescence terminal at the end of the stem or branches, 2-flowered (*E. modestiflorum*) to several-flowered (if several-flowered usually lax and noticeably decumbent); rachis when elongate often somewhat fractiflex, usually slender. Bracts of the inflorescence variable in size and texture, more or less conspicuous, more or less carinate when small, rounded and ecarinate on their back when large (*E. modestiflorum*), subacute to rather rounded-obtuse, 5 mm. up to 1.7 cm. long, up to 1.2 cm. broad when spread, not maculate. Flowers variable in size and texture, usually somewhat coriaceous. Lateral and dorsal sepals similar, the laterals slightly broader, 4.5–13 mm. long, 1.5–3 mm. wide, lanceolate to elliptic-oblong, more or less carinate at the apex on the exterior surface (laterals

slightly more so) and sometimes dentately so in the *E. modestiflorum* form, subacute to acute. Petals 4.5–13 mm. long, .8–2.3 mm. wide, linear to linear-spatulate, acutish to rounded-obtuse. Labellum adnate to the column the entire length of the column; lamina simple to occasionally subtrilobulate, ovate to triangular-ovate, lanceolate-ovate or ovate-lanceolate, 4–9 mm. long, 2–5 mm. wide, rounded or obtuse to subacute, acute or acuminate at the apex, cordate or subcordate at base; callus somewhat variable in the distance that it extends down the lamina, its base usually distinctly bifurcate, its apex occasionally tending to be trilobulate and thus approaching var. *mixtum*. Column stout, extending slightly beyond the cordate base of the lamina of the labellum, its apex truncate to dorsally excavated, with or without two divergent dorsal terminal teeth (these more apt to be present in the *E. modestiflorum* form and also in var. *imbricatum*).

Epidendrum ramosum* Jacq. var. *imbricatum* (Lindl.) Ames, *Hubbard & Schweinfurth*, *comb. nov.

Epidendrum imbricatum Lindley, *Gen. & Sp. Orch.* (1831) 110, non Lam.

Epidendrum paranaense Rodrigues, *Gen. et Sp. Orch. Nov.* 2 (1882) 139 (fide Cogn.).

Epidendrum imbricatum Lindl. var. *angustifolia* Cogniaux in Martius, *Fl. Bras.* 3, pt. 5 (1898) 171.

Epidendrum biflorum Cogniaux in Bull. Herb. Boiss. ser. 2. 2 (1902) 337, text cut, nec Forst.f., nec Ruiz & Pav., nec Rodr.

Epidendrum Boissierianum Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 459.

Epidendrum santaclarensense Ames in Sched. Orch. 4 (1923) 49

Plant usually stout and branched, though occasion-

ally not much stouter than the *E. modestiflorum* variant of the typical form or only slightly branched (*E. Boissierianum*), up to 2 m. tall (fide Cogniaux in Mart. Fl. Bras. 3, pt. 5 (1898) 170). Stems erect or possibly more or less recumbent (rooted when recumbent), stout, commonly 5–6 mm. in diameter just below the inflorescence. Leaf-sheaths finely maculate in the extreme development. Leaves rather coriaceous, ligulate to oblong-lanceolate or rarely elliptic, 2.5–14.5 cm. long, 8–25 mm. broad (the main leaves commonly 15 mm. or more broad), apex entire or unequally bilobed. Inflorescence terminal, variable from 1- to 2-flowered (*E. Boissierianum*) to several-flowered. When it is several-flowered it is open (*E. santaclarensis*) to head-like (*E. imbricatum*). Bracts of the inflorescence (or spathes in *E. Boissierianum*) apt to be finely maculate (always so in the *E. santaclarensis* and *E. imbricatum* forms), 1.5–3 cm. long, usually imbricated (well separated in the *E. santaclarensis* form which was described from mature plants), apex rounded to subacute, often apiculate, rather strongly conduplicate and carinate or (in the *E. santaclarensis* form) rounded and ecarinate on the back, elliptic-oval to broad-ovate when spread out. Flowers rather coriaceous, approximate to 7–10 mm. apart in the *E. santaclarensis* form. Pedicel and ovary up to 3 cm. long (*E. santaclarensis* form). Lateral sepals variable in shape, lanceolate, oblong-lanceolate or ovate-lanceolate, somewhat oblique, 9–15 mm. long, 3–5 mm. wide, acute to acuminate, slightly carinate on the dorsal surface toward the apex. Dorsal sepal lanceolate, oblong-lanceolate or elliptic-lanceolate, 9–15 mm. long, 3–5.5 mm. wide, obtuse (rarely) to acute, slightly carinate on the dorsal surface near the apex. Petals very variable in shape, from linear to spatulate-elliptic, but commonly tending toward narrowly elliptic-lanceolate, 8.5–14.5 mm. long, 1.8–5.6 mm. wide, apex varying from obtuse

to acute. Lamina of labellum ovate, triangular-ovate (*E. santaclarens* form) to rarely broadly ovate, obtuse to acute. Disc normally with a callus similar to that of the typical form, but rarely with the apex somewhat trilobulate as in var. *mixtum* (specimen from Cocos Island). Column much as in the typical form, dorsal teeth usually lacking, if present they are small.

Var. *imbricatum* intergrades strongly with the typical form of the species and separation is at times difficult. Characters which make for its separation when grouped or even alone,—if they are extreme,—are the thicker stems, the presence of fine maculation on the leaf-sheaths and bracts, the more imbricated and conduplicate bracts (which are also apt to be more conspicuous), the tendency toward broader and larger leaves and the rather dense head-like inflorescences in the more extreme form.

Epidendrum ramosum* Jacq. var. *mixtum
(*Schltr.*) Ames, *Hubbard & Schreinfurth*, *comb. nov.*

Epidendrum mixtum Schlechter in *Fedde Repert.*
10 (1912) 294.

Plant very variable, erect, 15–100 cm. tall, nearly simple to heavily branched. Stems rather slender to very stout, sometimes flexuous. Leaves ligulate, variable in size from 2 cm. long and 4 mm. wide (in the simpler slender form) up to 24 cm. long and about 20 mm. wide (large leaves of the main stems in the branched stouter form). Inflorescence terminal on the branch or stem, usually drooping, racemose, several-flowered. Bracts of the inflorescence 6–16 mm. long, somewhat conduplicate and carinate on the outer surface, acute, elliptic to elliptic-ovate. Flowers similar to the typical form of the species. Lateral sepals lanceolate, somewhat asymmetrical, 10–16 mm. long, 2.5–3.5 mm. wide, acuminate, strongly carinate at the apex on the exterior surface and usually dentately

so. Dorsal sepal lanceolate, 9–15 mm. long, 2–3.5 mm. wide, acuminate, more or less carinate at the apex. Petals linear-ligulate, linear-lanceolate or narrowly lanceolate, 7.8–14.2 mm. long, 1–1.8 mm. wide, acute or more commonly acuminate. Lamina of the labellum narrowly triangular or more rarely ovate-triangular, 7–12.5 mm. long, 4–8 mm. wide, acute or usually long acuminate. Disc with a callus which is tridentate or trilobulate at its apex. Column not distinctive, much as in the typical form of the species.

Var. *mixtum* is separable from the typical form in having the apex of the callus tridentate or trilobulate and by the more acuminate apices of the floral segments, especially of the labellum. In the extreme form the very long leaves of the main stems is also diagnostic. It differs from var. *imbricatum* in the acuminate apices of the perianth segments and in usually drooping inflorescences. A tendency toward the tridentate or trilobulate apex of the callus is sometimes existent in var. *imbricatum*, especially so in the specimen from Cocos Island.

EPIDENDRUM DIFFORME ALLIANCE

The constituents of this alliance seem, as a whole, to be more consistent in vegetative characters than in those of the *Epidendrum ramosum* and *E. paniculatum* alliances, but the floral characters are variable, especially with regard to the labellum. The variations of the labellum are sufficiently distinct to differentiate three varieties, but intergrade too much to warrant maintaining them as species.

The typical form, as described from a Martinique specimen and as inadequately illustrated by Jacquin, is a comparatively small plant up to 30 cm. tall (16 cm. in Jacquin's illustration), caespitose with elliptic-oval leaves up to 6 cm. long and nearly 3 cm. wide. The inflorescence

is umbellate, about 5-flowered, the flowers are shown as small and the labellum would appear to be rather simple. Variations from the Jacquin type are numerous, especially with regard to the size of the plant, the size of the leaf, the number of the flowers in the umbel (rarely 1-flowered) and very noticeably in the size and contour of the lip.

The following synopsis sets fourth briefly the characters of the concepts that have formerly been considered separate species:

Epidendrum umbellatum Sw. is without sufficient description to differentiate it from the Jacquin type. Moreover, Swartz cites the Jacquin plate. Swartz's type came from Jamaica. Lindley accepted the name *E. umbellatum* in place of *E. difforme*, considering them one species.

Epidendrum latilabre Lindl. was described from a Brazilian plant in Herb. Hooker and from a living specimen sent him from the collection of Messrs. Loddiges. Its chief character is the lip which Lindley in his original description states is "four times broader than long, and curved downwards on each side, so as to bear no little resemblance to a stiffly starched lady's apron,". In Folia Orchidacea Epidendrum p.80, Lindley remarks, "Nevertheless, it is much to be doubted whether this is anything more than a gigantic variety of *E. umbellatum*." The drawing in the Lindley Herbarium of the Brazilian specimen which is in the Hooker Herbarium tends to confirm Lindley's statement.

Epidendrum subumbellatum Hoffmgg., the type of which is from Rio de Janeiro, Brazil, appears, from the description, to be a form with two to three flowers. The lip is 4-lobed with the lobes about equal.

Epidendrum umbelliferum J. F. Gmel. is so inadequately described that it is difficult to interpret its characteristics, but the reference "*Jacq. stirp. amer. t. 136?*" places it in the same alliance with *E. difforme*.

Epidendrum radiatum Hoffm. g., non Lindl., from Brazil is known to us only by the description. Its affinity is doubtful, but it is included here because both Lindley and Cogniaux cite it as probably a synonym of *E. latilabre*.

Epidendrum corymbosum Ruiz & Pav., non Lindl., described from two Peruvian collections, is referred to this alliance on the authority of Cogniaux who included it as a questionable synonym under *E. difforme*.

Epidendrum virens Hoffm. g., described from material collected near Rio de Janeiro, Brazil, is questionably referable to this alliance. It was described as being close to *E. subumbellatum*, but of more slender habit and with solitary flowers. It was included with a query in synonymy by Cogniaux (in Mart. Fl. Bras. 3, pt. 5 (1898) 139) under *E. latilabre*. This concept is only known to us through the original description.

Epidendrum arachnoideum Rodr. from Rio de Janeiro, Brazil, is, judging from the description, only a gigantic form of *E. difforme*.

Epidendrum chlorocorymbos Schltr. The type collection is Powell 82 from Panama. Specimens of the type collection show the papillose-asperate ovary which Schlechter mentions as a differentiating trait, but this trait is also more or less present in specimens from Salvador and Costa Rica. The lip is much like that of many other specimens of *E. difforme*.

Epidendrum firmum Reichb. f. The type collection is Wendland 1135, from Naranjo-Cartago in Costa Rica. Our tracing of the type shows a caespitose plant with four stems, the tallest of which is about 15 cm. high. The leaves are linear-ligulate, the flowers small, the mid-lobe of the labellum nearly as broad as long and obcordate.

Epidendrum majale Schltr. The type collection is Ad. Tonduz 17620, from San Ramon, Costa Rica. A specimen of this plant proves it to be the same as *E. fir-*

mum Reichb.f.

Epidendrum Storkii Ames was described from a plant collected by H. E. Stork 460, south of Cartago, Costa Rica. The stems are up to 17.5 cm. high, the leaves 2–5.5 cm. long, 7–18 mm. wide. The mid-lobe of the lip is about as broad as long, triangular-acute at the apex. The lamina of the lip is broader than long, 7–11 mm. long, 13.5–16 mm. broad.

Epidendrum simulacrum Ames. The type is from the Province of Chiriqui, Panama, Powell 298. It is a plant 19–24 cm. tall with oblong leaves about 4 cm. long and 1 cm. wide and rather small flowers. The mid-lobe of the lip is much as in *E. Storkii*, but the lamina of the labellum is about as broad as long, 5–6 mm. long, 5–6 mm. broad.

The transition from the typical form of *E. difforme* to var. *firmum*, the transition from var. *firmum* to var. *Storkii*, and again the transition from var. *Storkii* to var. *simulacrum* is clearly shown by the material which we have examined. Allowance being made for these intergrades, three rather constant variants from the typical form may be detected.

Other species which belong to the general alliance, but which have constant differences sufficient to set them apart as distinct species are *Epidendrum pudicum* Ames, *E. Barbeyanum* Kränzl. (*E. Amparoanum* Schltr.) and an undescribed species collected by C. W. Powell in Panama.

***Epidendrum difforme* Jacquin**, Enum. Pl. Carib. (1760) 29 and Select. Stirp. Am. (1763) 223, t. 136.

Epidendrum umbellatum Swartz, Prodr. Veg. Ind. Occ. (1788) 121.

Epidendrum umbelliferum J. F. Gmelin, Syst. Veg. (1791) 65.

? *Epidendrum corymbosum* Ruiz & Pavon, Syst. Veg. (1798) 246.

Caularthron umbellatum Rafinesque, Fl. Tellur. 2 (1837) 41.

Epidendrum latilabre Lindley in Bot. Reg. 27 (1841) Misc. p. 77 (as "latilabrum").

? *Epidendrum subumbellatum* Hoffmannsegg in Linnaea 16 (1842) Litt. 232.

? *Epidendrum virens* Hoffmannsegg in Linnaea 16 (1842) Litt. 233.

Epidendrum radiatum Hoffmannsegg, Verz. Orch. (1843) 49 and in Bot. Zeit. 1 (1843) 832, non Lindl.

Epidendrum latilabium Reichenbach filius in Linnaea 25 (1852) 244, *sphalm.*

Epidendrum umbellatum Sw. var. *latilabre* Grisebach, Fl. Brit. W. Ind. (1864) 618.

Epidendrum arachnoideum Rodrigues, Gen. et Spec. Orch. Nov. 1 (1877) 60.

Auliza difformis Small, Fl. Miami (1913) 56.

Epidendrum chlorocorymbos Schlechter in Fedde Repert. Beihefte 17 (1922) 30.

Amphiglottis difformis Britton in Britton & P. Wilson, Bot. Porto Rico & the Virgin Islands 1 (1924) (Sci. Surv. Porto Rico & the Virgin Islands 5, pt. 2) 200.

Rhizome present, but the stems congested and in some cases appearing almost caespitose. Roots generally stout and whitish. Plant 6–47 cm. tall (including the inflorescence). Stems often more or less flexuous, 2–8 mm. in diameter, almost entirely concealed by the persistent flaring (often strongly so) leaf-sheaths. Leaves very variable in shape, ligulate-oblong to broadly oval-elliptic, 1.3–11 cm. long, 4–34 mm. wide, rounded to slightly bilobed at the apex. Inflorescence terminal, one- to several-flowered (usually three or more), subumbellate to um-

bellate. Flowers very variable in size, long-pedicellate. Lateral sepals oblong, lanceolate or elliptic to oblanceolate or obovate, 11–32 mm. long, 4.5–9 mm. wide, obtuse (rarely) to short-acuminate at the apex. Dorsal sepal lanceolate or oblong-lanceolate to oblanceolate or oblong-obovate, 10.5–34 mm. long, 3.8–8 mm. wide, subobtuse to short-acuminate at the apex. Petals filiform or linear-elliptic to broadly oblanceolate, 10–31 mm. long, .8–7 mm. wide, obtuse to acute or very rarely acuminate at the apex. Labellum nearly simple to trilobulate, transversely subquadrate (rarely) to reniform or transversely oval in general outline; lamina 7–18 mm. long, 1–3.4 cm. wide; mid-lobe wanting or obscure to well developed, when developed usually transversely oblong to semi-elliptic, entire to crenate or bilobed, retuse, truncate or apiculate at the apex; disc with two basal calli and more or less thickened nerves. Column adnate to the lip its entire length, dilated above; clinandrium slightly crenulate, denticulate or dentate to lacerate.

Epidendrum difforme Jacq. var. **firmum**
(*Reichb.f.*) Ames, *Hubbard & Schweinfurth, comb. nov.*

Epidendrum firmum Reichenbach filius, *Beitr. Orch. Centr. Am.* (1866) 87.

Epidendrum majale Schlechter in *Beihefte Bot. Centralbl.* 36, Abt. 2 (1918) 406.

Plant including the inflorescence 10–40 cm. tall. Stems congested, differing little in thickness from the typical form. Leaves linear-ligulate or narrowly lanceolate to oval-elliptic, 1.5–9 cm. long, 2–25 mm. wide, obliquely bilobulate at the apex. Lateral sepals obliquely elliptic-lanceolate to oblanceolate-oblong, 11–22 mm. long, 4.5–6.9 mm. wide, more or less carinate on the exterior surface especially toward the apex which is acute or acuminate. Dorsal sepal elliptic, oblanceolate or oblanceo-

late-oblong, 11–22 mm. long, 3.2–7 mm. wide, often slightly carinate at the apex on the exterior surface, sub-acute to short-acuminate at the apex. Petals filiform- or linear-spatulate to linear-oblongate, 10.8–20 mm. long, 1.2–2 mm. wide, obtuse to acute. Labellum much like the typical form in general outline, 5–19 mm. long, 8.5–20 mm. wide, distinctly 3-lobed; mid-lobe usually rather subquadrate, rarely tending to reniform or quadrate-ovate, its apex truncate or retuse or somewhat bilobed, often apiculate; disc much as in the typical form with two basal calli, but the mid-nerve is apt to be thickened even to the apex of the lip. Column adnate to the claw of the lip and its clinandrium lacerate or rarely only dentate.

Var. *firmum* is set off from the typical form by having the mid-lobe of the lip at most little broader than long, subquadrate. From var. *Storkii* and var. *simulacrum* it is separable by the truncate, retuse or somewhat bilobed apex of the mid-lobe of the lip. The leaves in typical var. *firmum* are often narrower than in the typical form of the species, but they are not constant in this respect.

Epidendrum difforme Jacq. var. **Storkii** (Ames) Ames, *Hubbard & Schaeinfurth, comb. nov.*

Epidendrum Storkii Ames in Sched. Orch. 7 (1924) 10.

Plant 12–37 cm. tall (including the inflorescence). Stems usually rather stout and congested. Leaves oblong- or lanceolate-elliptic to elliptic, 1.5–8.3 cm. long, 5–25 mm. wide, unequally bilobed at the obtuse apex. Leaf-sheaths complanate and dilated upward. Inflorescence terminal, subumbellate, 2- 6-flowered. Flowers medium-sized, greenish, long-pedicelled. Lateral sepals oblong or elliptic-lanceolate to oblongate or oblong-elliptic, 16–22 mm. long, 5–6 mm. wide, slightly asymmetric, acute or acuminate, thickened and slightly carinate at the tip.

Dorsal sepal oblong-elliptic to oblanceolate, 16–23 mm. long, 4–6 mm. wide, obtuse to acute, somewhat thickened and carinate at the tip, tending to be revolute on the margin. Lamina of the lip subquadrate-ovate or subquadrate-reniform in general outline, 7–11 mm. long, 13.5–16 mm. broad, distinctly 3-lobed; mid-lobe quadrate to subquadrate-ovate, apex usually triangular acute and apiculate or rarely truncate and slightly retuse (transition to var. *firmum*). Column as in other forms, with the clinandrium usually lacerate or rarely only denticulate.

Var. *Storkii* grades into both var. *firmum* and the typical form of the species and in a lesser degree into var. *simulacrum*. From the species proper and from var. *firmum* it is separable by the triangular-acute apex of the mid-lobe of the labellum. From var. *simulacrum* the shape and larger size of the lip separate it clearly.

Epidendrum difforme Jacq. var. **simulacrum** (Ames) Ames, *Hubbard & Schweinfurth, comb. nov.*

Epidendrum simulacrum Ames in Sched. Orch. 6 (1923) 75.

Plant including the inflorescence 18–26 cm. tall. Stem rather more slender than its nearest ally var. *Storkii*, somewhat flexuous. Leaves oblong, narrowed toward the ends, 1–4 cm. long, 2–10 mm. wide, about 4 cm. apart, obtusely and unequally bilobed at the tip. Flowers smaller than commonly the case in the other forms, borne in umbel-like clusters. Pedicel with the ovary slender, up to 3 cm. long. Lateral sepals obliquely elliptic-oblanceolate, 9–10 mm. long, 3 mm. wide, apex thickened and carinate on the exterior surface and short-acuminate. Dorsal sepal oblong-elliptic, about 10 mm. long, 2.5 mm. wide, thickened and revolute-margined at the apex, short-acuminate. Petals linear-spatulate, about 9 mm. long, 1 mm. wide, subacute. Labellum with a suborbicular-

cordate lamina about 5–6 mm. long and broad; mid-lobe shallowly trilobulate to undulate-simple, apiculate; disc bicallose at base with the center marked by three more or less thickened nerves. Column arcuate, adnate to the lip for its entire length; clinandrium minutely denticulate.

Var. *simulacrum* approaches var. *Storkii* most closely, but is separable by its almost orbicular and smaller lip. It differs from exceptionally small-flowered specimens of the typical form of the species in having the mid-lobe of the lip little broader than long.

EPIDENDRUM PANICULATUM ALLIANCE

The members forming this alliance, geographically extending over a much larger area than the two alliances already discussed, show great variation in both vegetative and floral characters. These variations, however, do not seem to indicate the presence of several different species, indeed they do not seem to exhibit sufficiently stable characters through which to segregate varieties. It appears to us, therefore, after careful study of an abundance of material, that a single polymorphic species is represented. Closely allied to this polymorphic species, but capable of clear separation, are several other species. The earliest specific name applied to a member of this alliance is *Epidendrum paniculatum* Ruiz & Pav. and this name, we believe, should be adopted for the polymorphic species.

Epidendrum paniculatum was described by Ruiz and Pavon as follows: “*E. foliis oblongo-lanceolatis, floribus paniculatis, nectarii lacinia intermedia bifida; lacinulis extrorsum flexis.*” While this description is too indefinite to place the plant with certainty, it appears capable of application to only six species (including *E. paniculatum*) which have been reported from Peru, the type locality of the species, all of which belong to this general alliance. In the absence of a knowledge of the specimens upon

which this species was based, it seems advisable to accept Lindley's interpretation of *E. paniculatum*, particularly in view of the fact that he had seen a Pavon plant from Peru, in Herb. Lambert, collected in Huayaquil: the type was collected in Muña. Lindley described the plant as having oblong-lanceolate acuminate leaves, a many-flowered crowded panicle, oblong sepals externally varicose on the veins, filiform petals, and a 4-lobed labellum of which the forward lobes are divaricate and linear. In *Folia Orchidacea Epidendrum* (1853) 56, Lindley cites as representative of *E. paniculatum*, among other collections, Funck & Schlim 1448 and Schlim 68. We have photographs of these sheets which are characteristic of the conception of *E. paniculatum* widely prevalent today. This form has been reported from Martinique, Colombia, Venezuela, Ecuador, Bolivia and Peru and belongs to one of the two basic groups into which the alliance has been previously divided. The other group is represented by *Epidendrum floribundum* HBK. of which the type collection is from Brazil and represents a species which is distributed through Mexico and Central America extending southward to Brazil, Ecuador and Peru in South America. It is described and illustrated (upper portion only) by Humboldt, Bonpland & Kunth (*Nov. Gen. et Sp. Pl.* 1 (1816) 353, t. 86) as a plant about a foot high with elliptic-lanceolate acuminate leaves and with a rather open panicle, the branches subtended by lanceolate acuminate bracts which are up to 3.8 cm. long. The flowers are about 1.5 cm. across, with lanceolate acuminate and reflexed sepals about 1 cm. long. The petals are linear-spatulate and slightly longer; the lip is 4-lobed with an elongate tubular claw which is adnate to the column. The lateral lobes of the lip are subrotund-quadrate and the mid-lobe is transversely linear-oblong with divaricate lobules, separated from the lateral lobes by a much-nar-

rowed portion; the lobules are at right angles to the median axis, with acute apices, slightly retrorse and falcate-oblongate in outline and from tip to tip much exceed the lateral lobes in spread; disc with two basal calli and a central somewhat rhombic thickening which extends upon the mid-lobe. Column clavate, extending to the base of the lateral lobes of the lip.

Critical examination of the material referred to *E. paniculatum* and *E. floribundum* leads us to believe that these concepts are not separable from each other although Lindley and Reichenbach kept them distinct. Lindley in *Folia Orchidacea* placed them in different sections of the genus, *E. paniculatum* in *Amphiglottium* (Polyclada) and *E. floribundum* in *Eupidendrum* (Paniculata). It is noteworthy, however, that Lindley cites Funck & Schlim 1448 under both species, and under *E. floribundum* makes the following comment: "A great branching green-flowered species, very much like *E. paniculatum* and *laxum*, differing however in the want of spathaceous bracts." We take occasion to note here that we do not feel that *E. laxum* belongs to this alliance and that the presence or absence of spathaceous bracts has not proved to be a valid character upon which to separate species in the genus *Epidendrum*.

From each of these basic groups or species (*E. paniculatum* and *E. floribundum*) there have been segregated, from time to time, many so-called species and varieties. However, since we are unable to separate the basic groups, it is obvious that segregates from them are open to question. Of the several parts of the plant showing the variations upon which segregation has been based, the labellum (especially the mid-lobe) is the one most often emphasized by authors. The differences in this part, however, are very inconstant and vary with regard to length and breadth of the lobules, type of sinus or isthmus between

the mid-lobe and the lateral lobes, in the degree and direction (antrorse or retrorse) of divergence and in other respects. Taken as a whole these variations are not correlated with other characters and should be regarded as individual rather than as specific or varietal differences. Likewise the shape of the leaf, the habit of the plant and the simple or compound character (racemose or paniculate) of the inflorescence do not constitute valid characters for the recognition of more than one species.

The species and varieties usually considered distinct, but which we believe comprise a polymorphic species, are briefly characterized as follows:

Epidendrum densiflorum Hook. The type collection was made in Mexico by Parkinson. The plate in Curtis's Botanical Magazine shows rather broad elliptic leaves and a dense panicle of greenish flowers slightly tinged with brownish purple. The sepals are reflexed and elliptic-ob lanceolate; the petals are slightly shorter than the sepals and narrowly spatulate; the lip is 3-lobed. The lateral lobes of the lip are shortly dolabriform and the mid-lobe is transverse, composed of two triangular divaricate lobules (separated from the lateral lobes by a narrow slit), with its apex retuse. The spread of the lobules of the mid-lobe from tip to tip is less than that of the lateral lobes.

Epidendrum rubrocinctum Lindl. was described from a plant sent to Lindley by Bateman from the garden of Mr. Brocklehurst. It is described as having an ample nodding panicle and is usually considered to be the same form as *E. densiflorum*.

Epidendrum laeve Lindl. Discovered by Hartweg at Pasto, Popayan, Colombia. A form with lanceolate leaves and simple many-flowered panicle. The lip was described as 4-lobed, the posterior lobes cuneate-rotundate, the anterior lobes linear and divaricate. Said to be allied to *E. paniculatum*.

Epidendrum ornatum Lem. Said to have been sent to Van Houtte from the Belgian colony of Santo Thomas [where?]. It was described as having a nodding simple raceme, and the leaves, varying from narrowly oblong to lanceolate, were said to be violet. The sepals were described as fleshy, oblong-cochleate and verruculose outside; the lip 3-lobed and coriaceous. The lateral lobes of the lip are irregularly rotundate; the mid-lobe has oblong, obtuse, divaricate lobules. The disc is tricarinate and at base bituberculate. The flowers are green, the lip white with red stripes forming a spot.

Epidendrum floribundum HBK. var. *lilacinum* Reichb.f. was described from plants collected in Venezuela at Merida (Moritz no. 233) and in Colombia at Pamplona (Funck & Schlim no. 1448). The perianth segments are purple outside, the lip is white.

Epidendrum paniculatum Ruiz & Pav. var. *cuspidatum* Lindl. Type collection from Peru (Matthews). The chief character given by Lindley is the oblong, suddenly cuspidate leaves.

Epidendrum paniculatum Ruiz & Pav. var. *longicrura* Lindl. was described from specimens from Peru (McLean) and Bolivia (Bridges). Lindley set them off from *E. paniculatum* as follows: "Leaves very acuminate. Front lobes of lip very long and falcate."

Epidendrum polyanthum Lindl. var. *densiflorum* (Hook.) Lindl. is based on *E. densiflorum* Hook.

Epidendrum floribundum HBK. var. *convexum* Lindl. was based on a Hartweg plant from the Hacienda de Palmas, near Guaduas, Colombia. It is thus diagnosed by Lindley: "Flowers smaller, shorter, with a roundish, denticulate, obscurely four-lobed lip."

Epidendrum turialvae Reichb.f. of which the type is from Turialba, Costa Rica, collected by Wendland. Reichenbach also had a specimen from W. Saunders.

The Reichenbach drawing of the upper portion of the plant shows two linear-lanceolate leaves about 15 cm. long and 1 cm. wide surmounting a stem concealed by persistent leaf-sheaths. Peduncle up to the inflorescence slender, about 12 cm. long, with three or four close tubular sheaths. Inflorescence racemose. Flowers rather small for the alliance, subtended by scale-like bracts. Sepals and petals reflexed. Lip 4-lobed; lateral lobes subrotund; mid-lobe transverse, composed of two divaricate falcate lobules whose spread exceeds that of the lateral lobes, separated from the lateral lobes by a deep rounded sinus. In recent years Dr. Schlechter has determined as *E. turialvae* specimens with elliptic leaves and well-developed paniculate inflorescences. This concept of *E. turialvae* seems to us to be erroneous.

Epidendrum piliferum Reichb.f. of which the type is a Warscewicz plant from Chiriqui, Costa Rica. On the basis of photographs of material in the Reichenbachian Herbarium, Reichenbach's interpretation would seem to be a plant with broadly elliptic acuminate leaves and a long-branched panicle, the branches recurved. The lobules of the mid-lobe are long and falcate-oblong.

Epidendrum resectum Reichb.f. Type sent to Veitch by Zahn from Chiriqui, Costa Rica. Described as having oblong-ligulate leaves (lanceolate, judged by the Reichenbach drawing) and a branched panicle. Reichenbach's drawing shows reflexed sepals and petals, the former oblong-lanceolate. The lip is 3-lobed; the lateral lobes semi-orbicular, more acute at their anterior end; the mid-lobe is 2-lobulate with an apicule between the porrectly divergent cuneate-oblong lobules whose spread is much exceeded by that of the lateral lobes. The base of the mid-lobe is cuneate, and as the apical portion of the lateral lobes extends forward beyond the base of the mid-lobe the deep sinus is well-marked.

Epidendrum falsiloquum Reichb.f. was described (from living material sent to Reichenbach by W. Bull) as having linear acuminate leaves, with purple lines on the sheaths and "The anterior lacinia of the lip has its from its narrow base two diverging linear blunt shanks,..."

Epidendrum Englerianum Lehm. & Kränzl. of which the type collection is from Tunguragua, Ecuador, Lehmann no. 6721 (Lehmann no. 6722 is also cited). Both numbers are represented in Herb. Ames. The plants range in height from 30–43 cm. including the inflorescence and are relatively slender. The leaves are narrowly lanceolate and acuminate, 3.5–11 cm. long, 4–13 mm. broad. Inflorescence terminal, simply and openly paniculate, up to 15 cm. long including the peduncle which has one or two slightly spreading spathe-like bracts; these are narrowly lanceolate, long-acuminate and up to 4.5 cm. long. Flowers about medium-sized (for the alliance). Lateral lobes of the labellum obliquely oval-alate. Mid-lobe of the labellum separated from the laterals by a distinct isthmus, its lobules linear-spatulate, divergent-falcate and truncately obtuse. Column only reaching to the base of the lateral lobes of the lip.

Epidendrum frons bovis Kränzl. was described from specimens collected north of Moyobamba, Department of Loreto, Province of Moyobamba, Peru, by Weberbauer no. 4639. Judging from the description and a photograph of the type sheet, it differs little vegetatively from normal *E. paniculatum*. The lateral lobes of the labellum are transversely and obliquely oval, deeply auriculate-cordate at base and their anterior margin is at right angles to the median axis of the labellum. The mid-lobe is separated from each lateral lobe by a narrow sinus, is 2-lobulate and the lobules are very divaricately falcate-oblong, their spread much exceeding that of the lateral lobes.

Epidendrum ionodesme Schltr. The type is from Cauca, Colombia, Langlassé no. 98. It was described as about 60 cm. tall with oblong-ligulate leaves 11–13 cm. long, 2.5–3 cm. wide and with a many-branched panicle. As later illustrated (Fedde Repert. Beihefte 57 (1929) t. 47, Nr. 182) the lip has the spread of the lobules of the mid-lobe about equal to that of the lateral lobes. The lobules of the mid-lobe are obliquely divergent, linear-oblong and obtuse.

Epidendrum longicrura Schltr., collected by Madero in Cauca, Colombia, is most noticeable (as shown by the figure in Fedde Repert. Beihefte 57 (1929) t. 48, Nr. 186) in having very long obliquely divergent linear-oblong obtuse lobules of the mid-lobe which form an inverted V and in having the lateral lobes of the labellum obliquely triangular-ovate. The anterior margin of the lateral lobes is about at right angles to the median axis.

Epidendrum macroceras Schltr. of which the type is H. Smith no. 2418 from Santa Marta, Colombia, is figured (Fedde Repert. Beihefte 57 (1929) t. 48, Nr. 187) as having a lip with obliquely rounded-dolabriform lateral lobes and a mid-lobe with falcately oblong-lanceolate divaricate lobules whose spread is nearly double that of the lateral lobes.

Epidendrum atacazoicum Schltr. (the type from Atacazo, Ecuador, collected by Sodiro, April 1900) is figured (Fedde Repert. Beihefte 57 (1929) t. 86, Nr. 334) as having the lateral lobes of the lip obliquely dolabriform and the mid-lobe as consisting of two divergent rather rectangular lobules whose spread is less than that of the lateral lobes.

Epidendrum bifalce Schltr. of which the type is Sodiro no. 63, collected on Mt. Chimborazo, Ecuador. It is figured (Fedde Repert. Beihefte 57 (1929) t. 116, Nr. 457) as having the lateral lobes of the lip asymmetrically

subquadrate, with the lateral margin crenulate-dentate; the lobules of the mid-lobe, forming an inverted V, are linear-oblong and obtuse. Disc with three elongated calli the lateral ones divergent [?].

Epidendrum caloglossum Schltr., of which the type collected by Sodiro, is from Pichincha, Ecuador. The lip is illustrated (Fedde Repert. Beihefte 57 (1929) t. 86, Nr. 336) as having very undulate-crenulate lateral margins on the obliquely quadrate-dolabriform lateral lobes and divaricate somewhat falcate rectangular-oblong lobules on the mid-lobe, their spread less than that of the lateral lobes.

Epidendrum isthmi Schltr., of which the type collection is Powell no. 104 from hills near Panama City, Panama. The type number is a plant with large elliptic-lanceolate leaves and a branched panicle. The most noticeable point of variance is the laciniate-dentate lateral margin of the lateral lobes as well as of the lobules of the mid-lobe of the lip. The lip is white with a greenish edge.

Epidendrum reflexum A. & S. The type is Valerio no. 61 collected at Arenal, Costa Rica. A restudy of the material fails to show any characters which will differentiate it from *E. paniculatum*. The leaves are lanceolate to oblong-lanceolate and the inflorescence is arcuate, racemose and shorter than the leaves (in this character suggesting *E. resectum* Reichb.f.).

Making due allowance for individual variation, it seems to us that all of the forms which have just been discussed should be considered as a single species. Other members of the general alliance, but possessing characters sufficiently diagnostic to separate them as distinct species, are *Epidendrum gratiosum* Reichb.f., *E. capricornu* Kränzl., *E. subnutans* A. & S. and *E. hondurensense* Ames.

In 1924, Dr. Schlechter described two species of this alliance from Colombia, *E. Arnoldi* and *E. subfloribundum*. These are known to us only through the original

descriptions and may or may not be separable from *E. paniculatum*. The status of one member of this alliance (*E. fastigiatum* Lindl.) is in doubt, as it is only known to us through the original description and a photograph of the type sheet in the Lindley herbarium on which Lindley has made drawings including one of the lip. Judging by the aspect of the plant and this drawing of the lip, it would seem that *E. fastigiatum* Lindl. is only a synonym of *E. paniculatum*, but the evidence is not convincing enough to warrant reduction. Two other members of this general alliance, — *E. parviflorum* Ruiz & Pav. and *E. patulipetalum* Schltr. (which we believe represent one species) differ from *E. paniculatum* chiefly in their smaller flowers. The petals and sepals are only 5 mm. long and the lamina of the lip 1.5 mm. long, 3 mm. wide. As these species are unknown to us through authentic specimens, it seems inadvisable to reduce them, though our feeling is that they merely represent exceptionally small-flowered forms of *E. paniculatum*.

***Epidendrum paniculatum* Ruiz & Pavon, Syst. Veg. (1798) 243.**

Epidendrum floribundum Humboldt, Bonpland & Kunth, Nov. Gen. et Sp. 1 (1816) 353 (Quarto ed.), 283 (Folio ed.), t. 86.

Epidendrum densiflorum Hooker in Bot. Mag. 66 (1840) t. 3791.

Epidendrum rubrocinctum Lindley in Bot. Reg. 29 (1843) Misc. p. 9.

Epidendrum laeve Lindley in Bot. Reg. 30 (1844) Misc. p. 24.

Epidendrum ornatum Lemaire in Fl. des Serres 4 (1848) 334 B.

Epidendrum floribundum HBK. var. *lilacinum* Reichenbach filius in Linnaea 22 (1849) 840.

- Epidendrum paniculatum* Ruiz & Pav. var. *cuspidatum* Lindley, Fol. Orch. Epid. (1853) p. 56.
- Epidendrum paniculatum* Ruiz & Pav. var. *longicrure* Lindley, Fol. Orch. Epid. (1853) p. 56.
- Epidendrum polyanthum* Lindl. var. *densiflorum* (Hook.) Lindley, Fol. Orch. Epid. (1853) p. 60.
- Epidendrum floribundum* HBK. var. *convexum* Lindley, Fol. Orch. Epid. (1853) p. 91.
- Epidendrum syringaeiflorum* Warscewicz apud Reichenbach filius in Bonpl. 2 (1854) 111, in textu, *nomen* — Schlechter in Fedde Repert. Beihefte 7 (1920) 250, in synonym. (as *syringiflorum*).
- Epidendrum turialvae* Reichenbach filius in Gard. Chron. (1871) 1678 — Schlechter in Fedde Repert. Beihefte 17 (1922) 42 (as *Turialbae*).
- Epidendrum resectum* Reichenbach filius in Linnaea 41 (1876) 82.
- Epidendrum piliferum* Reichenbach filius in Linnaea 41 (1876) 83.
- Epidendrum falsiloquum* Reichenbach filius in Gard. Chron. ser. 2, 23 (1885) 566.
- Epidendrum Englerianum* Lehmann & Kränzlin in Engl. Bot. Jahrb. 26 (1899) 466.
- Epidendrum frons bovis* Kränzlin in Fedde Repert. 1 (1905) 181.
- Epidendrum ionodesme* Schlechter in Fedde Repert. Beihefte 7 (1920) 134; 57 (1929) t. 47, Nr. 182.
- Epidendrum longicrure* Schlechter in Fedde Repert. Beihefte 7 (1920) 137; 57 (1929) t. 48, Nr. 186.
- Epidendrum macroceras* Schlechter in Fedde Repert. Beihefte 7 (1920) 138; 57 (1929) t. 48, Nr. 187.
- Epidendrum atacazoicum* Schlechter in Fedde Repert. Beihefte 8 (1921) 67; 57 (1929) t. 86, Nr. 334.
- Epidendrum bifalce* Schlechter in Fedde Repert. Beihefte 8 (1921) 67; 57 (1929) t. 116, Nr. 457.

Epidendrum caloglossum Schlechter in Fedde Repert. Beihefte 8 (1921) 68; 57 (1929) t. 86, Nr. 336.

Epidendrum Isthmi Schlechter in Fedde Repert. Beihefte 17 (1922) 34.

Epidendrum reflexum Ames & Schweinfurth in Sched. Orch. 8 (1925) 49.

Plant caespitose, variable in height and stoutness, up to 1.4 m. tall including the inflorescence. Stems simple, erect, ranging from rather slender to stout, 2 up to 20 mm. (possibly more) in diameter, entirely concealed by leaf-sheaths or their fibrous remains. Leaves linear-lanceolate to elliptic or elliptic-oval, 4–25 cm. long, .5–6.8 cm. wide, acute to long-acuminate or sometimes cuspidate at the apex and usually narrowed toward the base, submembranaceous to subcoriaceous in texture, often purplish on the under surface or purple-veined according to authors. Peduncle below the inflorescence variable in length and diameter, from almost wanting up to 18 cm. (perhaps more) long, with or without a subtending spathe; spathe, if present, up to 9 cm. long and 14 mm. wide; there may also be present on the peduncle from one to five spathe-like sheaths which are variable in size, up to 6 cm. long and 8 mm. wide, usually acuminate and appressed. Inflorescence terminal, much exceeding the leaves or in some forms much surpassed by the leaves (*E. reflexum* and *E. resectum*), ranging from a simple few-flowered raceme to a compound panicle which may be open or densely flowered; branches of the panicle very variable in length and in the degree of divergence from the rachis (almost retrorse in some instances). Bracts of the inflorescence exceedingly variable, from small and inconspicuous to large and spreading, up to 7 cm. long and 6.5 mm. wide, usually lanceolate and acuminate. Floral bracts small, lanceolate to ovate, acute to acuminate. Flowers very variable in size, usually with the sepals reflexed and

the petals spreading or reflexed. Lateral sepals oblong-lanceolate, oblong-spatulate or rarely oblong-elliptic (sometimes obliquely so), 8.2–16 mm. long, 2.5–4.5 mm. wide, often concave especially toward the tip which is commonly somewhat thickened and subcarinate, subacute to acuminate-acute at the apex, smooth or asperate on the outer surface. Dorsal sepal somewhat narrower than the laterals, oblong-ob lanceolate, cuneate-spatulate or narrowly elliptic, 8.2–16 mm. long, 2–3.5 mm. wide, subacute to acuminate-acute at the apex. Petals filiform, narrowly oblanceolate or oblong-spatulate, 8–14.5 mm. long, .3–2 mm. wide, obtuse to acute at the apex, the margins toward the apex sometimes minutely denticulate. Labellum with a long claw which is adnate to the column; lamina ranging from nearly simple to 3- or 4-lobed, in general outline transversely subrectangular to subrotund or subquadrate, 4–9 mm. long, 5.8–12 mm. wide across the lateral lobes; lateral lobes very variable, being shallowly dolabriform, dolabriform, obliquely rhombic-dolabriform, obliquely triangular-ovate, obliquely ovate, obliquely oval or subrectangular, the posterior margin or angle is usually rounded forming a more or less cordate base, the anterior margin or angle is porrect or at right angles to the median axis, and in some instances bears a small upright lobule at its outer edge, the lateral margin of the lateral lobes varies from subentire to somewhat bilobular or undulate to somewhat lacerate (*E. isthmi* form); mid-lobe variable ranging from broadly truncate-cuneate to long-bilobulate, truncate, retuse (due to the porrect lobules) or protuberant and often apiculate at the apex. The lobules of the mid-lobe are exceedingly variable in shape and degree of divergence, ranging in shape from acinaciform through linear or falcately linear-oblong to narrowly triangular or else to oblong, spatulate-oblong or narrowly rectangular. The degree of divergence is from

V-shaped to right-angled with the median axis or to somewhat retrorse. The lobules, 3-8 mm. long (measured from the central axis of the mid-lobe to their apex), are truncate or rounded to acuminate-acute at their apex which is sometimes somewhat lacerate (*E. isthmi* form) and are separated from the lateral lobes by a mere slit or the separation may consist of a well-marked isthmus. The disc bears at the base two more or less lamellate calli and is centrally thickened with three more or less developed approximate parallel ridges of which the central one extends upon the mid-lobe and in some instances reaches the apicule. Column entirely adnate to the lip, clavate-dilated from a slender tubular shank, often somewhat arcuate; clinandrium usually provided with a more or less developed tooth on each side.